the other a plate which gave rings of the same size as the plate of calcareous spar. But when we combine a system of rings produced by a crystal of zircon, with the system produced by calcareous spar, a different effect is produced; and the system, instead of being diminished, is increased, and is equal to that which would have been produced by a thin plate of calcareous spar, whose thickness is equal to the difference of the thicknesses of the plate of calcareous spar employed, and the plate of calcareous spar that would give rings of the same size as those given by the zircon alone. In the section "on crystals with two or more axes of polarization," Dr. Brewster observes that, although M. Biot considered mica as the only mineral possessing the compound structure indicating two axes, he had found the same structure in topaz, nitre, tartrate of potash and soda, sulphate of potash, acetate of lead, and mother-of-pearl, as early as 1813; and he points out the means of deducing the number of axes in crystals from their primitive forms. Dr. Brewster expresses the general law of the tints for crystals with one or more axes in the following manner. *The tint produced at any point of the sphere by the joint action of two axes is equal to the diagonal of a parallelogram whose sides represent the tints, and whose angle is double the angle formed by the directions in which the forces are exerted.*

The fourth and fifth sections of this paper relate to the resolution and combination of polarizing forces, and the reduction of all crystals to those with two or more axes; and to the polarizing structure of crystals that have the cube, the regular octohedron, and the rhomboidal dodecahedron for their primitive form. The sixth and concluding section describes the artificial imitation of all the classes of doubly refracting crystals, by means of plates of glass; in which the author demonstrates that the polarizing structure depends entirely upon the external form of the plate, and on the mode of aggregation of its particles. When its form is circular, it has only one axis of polarization, which is attractive if the density diminishes towards the centre, and repulsive if it increases towards the centre; but when its form is rectangular or elliptical, it then has two axes of polarization, the strongest of which appears to be attractive, and the weakest repulsive. The elementary spheroid of crystals with double axes may be supposed, says the author, to be formed by elliptical plates bent into spheroidal strata; and the spheroid itself may be constructed by spheroidal strata of glass, it then exhibiting all the complicated phenomena produced by the simultaneous actions of two unequal axes.

On the Parallax of certain fixed Stars. By the Rev. John Brinkley, *D.D. F.R.S. and Andrews Professor of Astronomy in the University of Dublin.* Read March 5, 1818. [*Phil. Trans.* 1818, *p.* 275.]

Since the author's former observations on the parallax of α Lyræ, published by the Royal Society in a Letter to Dr. Maskelyne, he (the author) has met with apparent motions in several of the fixed stars,

which he could only explain by referring them to parallax. Among these stars, α Aquilæ exhibited the greatest change of place.

In consequence of the Astronomer Royal having doubted the correctness of the author's conclusions upon this point, he has anxiously engaged in observations relating to it during the last sixteen months; and although the results in respect to α Lyræ and to Arcturus have not been very uniform, the recent observations on α Cygni are consistent with the former ones, and exhibit the same discordance between the summer and winter observations as before. In regard to α Aquilæ also, the observations detailed in the present paper are remarkably coincident with those formerly detailed; and the author thinks that it is to this star we must look for the final decision of the question concerning parallax.

Referring to Mr. Pond's observations, Dr. Brinkley is led to entertain doubts of the fitness of an instrument similar to the Greenwich mural circle for so delicate an inquiry, founded upon remarks detailed in the paper respecting the elements used in computing the index error, and which are independent of the uncertainties to which the observation itself is also subject. It is, however, from the uncertainty of the elements used in the reductions, and not from any errors of the observations, or from any defect in the construction of the instrument alluded to, that Dr. Brinkley is induced to consider the observations hitherto made at Greenwich as not affording conclusive results as to the existence or non-existence of parallax. In the present state of astronony, however, it will be allowed that the relative fitness of instruments for ascertaining with precision the smaller motions, whether real or apparent, of the fixed stars, is an object of importance.

On the Urinary Organs and Secretions of some of the Amphibia. By John Davy, *M.D. F.R.S. Communicated by the Society for the Improvement of Animal Chemistry.* Read April 2, 1818. [*Phil. Trans.* 1818, *p.* 303.]

In several species of serpents which were examined by Dr. Davy, the kidneys were nearly as large as the liver, long, narrow and lobulated, and without a pelvis. Each lobule sends a small duct to the ureter, which terminates in a papilla situated in the cloaca, between the mouths of the oviducts, and having its point directed towards a receptacle for the urine, which, though a continuation of the intestine, may be considered as distinct from the rectum and cloaca, with which it communicates only by sphincter orifices.

The urinary ducts often contain a white matter, visible through their coats, which gradually accumulates in the receptacle till it forms a mass which, when of so large a size as to distend the part, is usually expelled by an extraordinary effort of the animal, most commonly in the act of devouring its food. The urine, at first soft, gradually hardens by exposure, and then looks like chalk; it consists of nearly pure uric acid.